

1. A nozzle for dispensing a liquid adhesive to strand materials used in the manufacture of nonwoven products, comprising:

a nozzle body having a liquid supply passage and a first liquid discharge orifice in fluid communication with said liquid supply passage,

5 said first liquid discharge orifice extending along a first axis and configured to discharge a first bead of the adhesive,

first and second pattern air discharge orifices in said nozzle body and associated with said first liquid discharge orifice, said first and second pattern air discharge orifices arranged 180° apart on opposite sides

10 of said first liquid discharge orifice and configured to direct pressurized pattern air at the first bead of adhesive discharged through said first liquid discharge orifice thereby vacillating the first bead of adhesive back and forth in a vacillation plane containing said first and second pattern air discharge orifices, and

15 first and second cleaning and stabilizing air discharge orifices in said nozzle body and associated with said first liquid discharge orifice, said first and second cleaning and stabilizing air discharge orifices arranged 180° apart on opposite sides of said first liquid discharge orifice and positioned 90° from said first and second pattern air discharge orifices, said first and
20 second cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said first axis to clear airborne contaminants away from said first liquid discharge orifice and to stabilize the first bead of adhesive in said vacillation plane.

2. The nozzle of claim 1, wherein said nozzle body further comprises:

a second liquid discharge orifice in fluid communication with said liquid supply passage, said second liquid discharge orifice extending
5 along a second axis and configured to discharge a second bead of the adhesive,

third and fourth pattern air discharge orifices in said nozzle body and associated with said second liquid discharge orifice, said third and fourth pattern air discharge orifices arranged 180° apart on opposite sides
10 of said second liquid discharge orifice and positioned in said vacillation plane, said third and fourth pattern air discharge orifices configured to direct pressurized pattern air at the second bead of adhesive discharged through said second liquid discharge orifice thereby vacillating the second bead of adhesive back and forth in said vacillation plane, and

15 third and fourth cleaning and stabilizing air discharge orifices in said nozzle body and associated with said second liquid discharge orifice, said third and fourth pattern air discharge orifices arranged 180° apart on opposite sides of said second liquid discharge orifice and positioned 90° from said third and fourth pattern air discharge orifices, said third and fourth
20 cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said second axis to clear airborne contaminants away from the second liquid discharge orifice and to stabilize the second bead of adhesive in said vacillation plane.

3. The nozzle of claim 2, wherein said nozzle body further comprises:

a third liquid discharge orifice in fluid communication with said liquid supply passage, said third liquid discharge orifice extending along a third axis and configured to discharge a third bead of the adhesive,

fifth and sixth pattern air discharge orifices in said nozzle body and associated with said third liquid discharge orifice, said fifth and sixth pattern air discharge orifices arranged 180° apart on opposite sides of said third liquid discharge orifice and positioned in said vacillation plane, said

fifth and sixth pattern air discharge orifices configured to direct pressurized pattern air at the third bead of adhesive discharged through said third liquid discharge orifice thereby vacillating the third bead of adhesive back and forth in said vacillation plane, and

fifth and sixth cleaning and stabilizing air discharge orifices in said nozzle body and associated with said third liquid discharge orifice, said fifth and sixth pattern air discharge orifices arranged 180° apart on opposite sides of said third liquid discharge orifice and positioned 90° from said fifth and sixth pattern air discharge orifices, said fifth and sixth cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said third axis to clear airborne contaminants away from said third liquid discharge orifice and to stabilize the third bead of adhesive in said vacillation plane.

4. The nozzle of claim 1, wherein said first and second pattern air discharge orifices converge toward said first axis.

5. The nozzle of claim 1, wherein said nozzle body further comprises a projecting nozzle portion having an apex and a base, said first liquid discharge orifice opening on said apex and said first and second pattern air discharge orifices opening on said base.

6. The nozzle of claim 5, wherein said first and second cleaning and stabilizing air discharge orifices open on said apex.

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7. A device for dispensing a liquid adhesive to materials used in the manufacture of nonwoven products, comprising:

a valve body including an adhesive input passage including a valve mechanism operative to selectively allow and prevent adhesive flow through said adhesive input passage,

a nozzle body coupled to said valve body, said nozzle body having a liquid supply passage in fluid communication with said adhesive input passage to selectively receive the adhesive flow and a first liquid discharge orifice in fluid communication with said liquid supply passage, said first liquid discharge orifice extending along a first axis and configured to discharge a first bead of the adhesive,

first and second pattern air discharge orifices in said nozzle body and associated with said first liquid discharge orifice, said first and second pattern air discharge orifices arranged 180° apart on opposite sides of said first liquid discharge orifice and configured to direct pressurized pattern air at the first bead of adhesive discharged through said first liquid discharge orifice thereby vacillating the first bead of adhesive back and forth in a vacillation plane containing the first and second pattern air discharge orifices, and

first and second cleaning and stabilizing air discharge orifices in said nozzle body and associated with said first liquid discharge orifice, said first and second cleaning and stabilizing air discharge orifices arranged 180° apart on opposite sides of said first liquid discharge orifice and positioned 90° from said first and second pattern air discharge orifices, said first and

- 25 second cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said first axis to clear airborne contaminants away from said first liquid discharge orifice and to stabilize the first bead of adhesive in said vacillation plane.

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8. The device of claim 7, wherein said nozzle body further comprises:

a second liquid discharge orifice in fluid communication with said liquid supply passage, said second liquid discharge orifice extending
5 along a second axis and configured to discharge a second bead of the adhesive,

third and fourth pattern air discharge orifices in said nozzle body and associated with said second liquid discharge orifice, said third and fourth pattern air discharge orifices arranged 180° apart on opposite sides
10 of said second liquid discharge orifice and positioned in said vacillation plane, said third and fourth pattern air discharge orifices configured to direct pressurized pattern air at the second bead of adhesive discharged through said second liquid discharge orifice thereby vacillating the second bead of adhesive back and forth in said vacillation plane, and

15 third and fourth cleaning and stabilizing air discharge orifices in said nozzle body and associated with said second liquid discharge orifice, said third and fourth pattern air discharge orifices arranged 180° apart on opposite sides of said second liquid discharge orifice and positioned 90° from said third and fourth pattern air discharge orifices, said third and fourth
20 cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said second axis to clear airborne contaminants away from the second liquid discharge orifice and to stabilize the second bead of adhesive in said vacillation plane.

9. The device of claim 8, wherein said nozzle body further comprises:

a third liquid discharge orifice in fluid communication with said liquid supply passage, said third liquid discharge orifice extending along a third axis and configured to discharge a third bead of the adhesive,

fifth and sixth pattern air discharge orifices in said nozzle body and associated with said third liquid discharge orifice, said fifth and sixth pattern air discharge orifices arranged 180° apart on opposite sides of said third liquid discharge orifice and positioned in said vacillation plane, said fifth and sixth pattern air discharge orifices configured to direct pressurized pattern air at the third bead of adhesive discharged through said third liquid discharge orifice thereby vacillating the third bead of adhesive back and forth in said vacillation plane, and

fifth and sixth cleaning and stabilizing air discharge orifices in said nozzle body and associated with said third liquid discharge orifice, said fifth and sixth pattern air discharge orifices arranged 180° apart on opposite sides of said third liquid discharge orifice and positioned 90° from said fifth and sixth pattern air discharge orifices, said fifth and sixth cleaning and stabilizing air discharge orifices configured to direct pressurized cleaning and stabilizing air in a direction parallel to said third axis to clear airborne contaminants away from said third liquid discharge orifice and to stabilize the third bead of adhesive in said vacillation plane.



10. The device of claim 7, wherein said first and second pattern air discharge orifices converge toward said first axis.

11. The device of claim 7, wherein said nozzle body further comprises a projecting nozzle portion having an apex and a base, said first liquid discharge orifice opening on said apex and said first and second pattern air discharge orifices opening on said base.

12. The device of claim 11, wherein said first and second cleaning and stabilizing air discharge orifices open on said apex.

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13. A method of applying an adhesive bead from a nozzle onto a strand of material, the nozzle including a liquid discharge orifice, first and second pattern air discharge orifices associated with the liquid discharge orifice and first and second cleaning and stabilizing air jet orifices associated with the liquid discharge orifice, the method comprising:

5 moving the strand of material in a linear direction,

positioning the liquid discharge orifice of the nozzle spaced apart from the strand of material,

extruding the adhesive bead from the liquid discharge orifice

10 toward the strand of material,

discharging first and second pattern air jets respectively from the first and second pattern air discharge orifices of the nozzle with the first and second pattern air discharge orifices placed 180° apart in a vacillation plane which is perpendicular to the linear direction,

15 vacillating the adhesive bead back and forth in the vacillation plane with the pattern air jets discharged from the first and second pattern air discharge orifices while the adhesive bead attaches to the strand of material, and

discharging cleaning and stabilizing air jets from the first and

20 second cleaning and stabilizing air jet orifices positioned 180° apart in a plane which is perpendicular to the vacillation plane, the cleaning and stabilizing air jets clearing airborne contaminants away from the liquid discharge orifice and stabilizing the vacillating bead of adhesive in the vacillation plan .

14. The method of claim 13, wherein the liquid discharge orifice extends along an axis and discharging the pattern air jets further comprises:
discharging the first and second pattern air jets respectively from the first and second pattern air discharge orifices in a converging
5 manner toward the axis.

15. The method of claim 14, wherein discharging the cleaning and stabilizing air jets further comprises:
discharging the cleaning and stabilizing air jets parallel to the axis.

16. The method of claim 13, further comprising:
discharging the first and second cleaning and stabilizing air jets at a lower pressure than the first and second pattern air jets.

17. The method of claim 13, further comprising:
discharging the first and second cleaning and stabilizing air jets intermittently, and
discharging the first and second pattern air jets continuously at
5 the adhesive bead.

18. The method of claim 13, further comprising:
- stopping the extrusion of the adhesive bead, and
- while the extrusion is stopped, continuing the discharge of the cleaning and stabilizing air jets.

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